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1   RECORD OF ORAL HEARING

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3   UNITED STATES PATENT AND TRADEMARK OFFICE

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6   BEFORE THE BOARD OF PATENT APPEALS

7   AND INTERFERENCES

8   _____

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10   Ex parte FRANCOIS KUBICA

11   _____

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13   Appeal 2008-438

14   Application 10/716,461

15   Technology Center 3600

16   _____

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18   Oral Hearing Held: July 9, 2008

19   _____

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22 Before WILLIAM F. PATE, III, JENNIFER D. BAHR, and

23 JOHN C. KERINS, Administrative Patent Judges

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26 ON BEHALF OF THE APPELLANT:

27

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35 The above-entitled matter came on for hearing on July 9, 2008, commencing

36 at 9:07 a.m. at the U.S. Patent and Trademark Office, 600 Dulany Street,

37 Alexandria, Virginia.

1   P R O C E E D I N G S

2

3   JUDGE PATE: Mr. Tracy. Good morning to you.

4   EDWARD TRACY: Good Morning.

5   JUDGE PATE: I'll let you get set up there. We've had time to go over

6   this case before hand and we're pretty familiar with the issues and we're

7   ready to hear your arguments for patentability.

8   EDWARD TRACY: OK great. OK in general I'd like to start by

9   discussing the art in general and I think that's really where the issues I think

10   in this case are, as far as claim 1 and even to claims 9 – 11, which will be

11   argued separately. In general in the control of a missile or aircraft as

12   described in the Internet section that I provided, you get the position of the

13   aircraft. You then decide, you then get some kind of feedback as to where

14   you are going. So for example with a missile, it would be a target position.

15   You would then determine a desired path to go, and then that would go into

16   a guidance algorithm. And the guidance algorithm would output the

17   command that you need to get to that position. And then that command goes

18   into an autopilot, which creates actuator commands to move control surfaces

19   to get there. Now in the present invention, it's been determined in the past to

20   separate guidance and autopilot into two different computers. That has led to

21   some redundancies as described in the background. What the present

22   invention does is it has guidance and autopilot on two separate computers,

23   and then a dedicated link between them. So for example in a missile it is

24   very critical that as soon as you get feedback as to where the target is, you

25   then need to get commands to the actuator as fast as possible, to continue

26   tracking. So that critical path calculations have to go as quickly as possible.

1   This of course is an aircraft and you get positions from a pilot, but even with

2   a pilot in automatic mode the position of the aircraft that is received from an

3   inertial sensor gets stale. So the longer you wait, those commands become

4   obsolete. So the critical path calculations are, must be done as fast as

5   possible to keep that from happening. And thus the present invention has

6   that dedicated link to provide those commands as quickly as possible. The

7   issue, or if I go to the art, Pages describes a computer where the PA 13

8   automatic pilot device 13, receives from computer 12 position in route of the

9   next point to be reached. Which is again the input to a guidance algorithm.

10   It then does both the guidance and the autopilot in that computer and sends,

11   as described it sends out commands to the actuators. So it doesn't divide the

12   way the present invention does, or the way the claimed invention does, and it

13   doesn't again have that link because it's all in the same computer. The issue

14   for claim 1 was the examiner was stating that the autopilot commands was

15   too broad or the exact, automatic pilot instructions was too broad and

16   therefore it read the sort of the line of sight elements that are being sent from

17   computer 12 to computer 13. Again it's our position that one skilled in the

18   art would know that the line of sight never could be the automatic pilot

19   instruction or the guidance commands. Those are simply an input to a

20   guidance algorithm again and not an output. And I believe in the examiners

21   answer, it stated that there was no definitions of that, or the only definition

22   was at the top of page 2, however as discussed in our reply brief later on, we

23   specifically define the automatic pilot instructions to include commanded

24   roll, commanded load factor and commanded yaw. And those are clearly

25   known in the art to be guidance commands. Unless, any argument that the

1   claims 9 – 11 are too vague I think is rebutted by the fact that those are

2   clearly known in the art.

3   JUDGE BAHR: I don't think the examiners saying the claims are too

4   vague, I think the examiners just saying that term is broad, and broad enough

5   to be met by what computer 12 outputs. Computer 12 definitely computes

6   something so what it's computing is definitely an output to some algorithm.

7   I don't it's fair to say that it's an input to an algorithm and not an output to

8   an algorithm, because it's clearly an output to some computation.

9   EDWARD TRACY: Right, but to what is known in the art as a

10   guidance algorithm the output of computer 12 is sort of the line of sight or

11   the position or the desired position which is an input to a guidance

12   algorithm. And that's what's sent to computer 13, or automatic pilot device

13   13. But especially with regard to claims 9 through 11 you know the line of

14   sight is very different from a commanded yaw or roll rate or load factor. The

15   response to that was simply that, that's just not a way of doing it.

16   However…

17   JUDGE BAHR: But those are dependant claims 9 through 11.

18   EDWARD TRACY: Correct, we've argued them separately.

19   JUDGE BAHR: So isn't claim one broader than that?

20   EDWARD TRACY: Yes. There's different ways I think you could…

21   the reason we didn't immediately collapse that into claim 1, for example in

22   missiles it's commanded yaw, pitch and roll. All three angles are the typical

23   guidance commands. Where in a plane I think it's typically the load factor,

24   the yaw and the roll are guidance commands.

25   JUDGE PATE: Did you have any other arguments?

26   EDWARD TRACY: No. I think that addresses all the main issues.

1   JUDGE PATE: Do you want to ask about the spec?

2   JUDGE BAHR: I was a little confused about something on page, the

3   paragraph bridging pages 1 and 2 of the specification.

4   EDWARD TRACY: OK

5   JUDGE BAHR: It looks to me like that first sentence that starts on

6   page 1, "the navigation computer receives guidance instructions and

7   guidance parameters and from these guidance instructions and parameters

8   produces automatic pilot instructions."

9   EDWARD TRACY: Right.

10   JUDGE BAHR: So it's known to have a computer that does that, and

11 then "the control computer converts these automatic pilot instructions into

12 commands for operating the automatic pilot." That sounds like what's going

13 on in claim 1.

14   EDWARD TRACY: It doesn't have dedicated… for example that

15 describes what happens in figure 1. Well figures 1 and 2. That 9a receives

16 the guidance instructions from 10 and then it receives the guidance

17 parameters from 12. It creates the automatic pilot commands, which it sends

18 across 13 and then 9b takes that and turns that into the actuator commands.

19 Which are either sent right to the actuator, figure 1, or they're sent just past

20 through computer 3 in figure 2.

21   JUDGE BAHR: Mm hmm. But they're definitely…It seems to me

22 that paragraph definitely indicates that it was known in the art to use a first

23 computer, a navigation computer to generate automatic pilot instructions

24 from guidance parameters and guidance instructions and then to transmit

25 back to a control computer that converts those into control surface operating

26 instructions. And then the next paragraph though, and this is what confused

1   me, the next paragraph goes on and says further in discussing these known

2   embodiments in a case where "the automatic pilot instructions are

3   transmitted via the control computer. The flight control computer receives

4   from the automatic pilot the commands for operating the automatic pilot

5   which have already been fully produced and that in consequence its roll

6   amounts to simply transmitting the automatic control commands

7   unmodified." That seems inconsistent with what's being described in the

8   paragraph above. Where it looks like the control computer actually converts

9   the automatic pilot instructions into something else. More specifically

10   control commands for actuators for the control surfaces. So which is it?

11   EDWARD TRACY: That is consistent. In the first paragraph it's

12   talking about computers 9a and 9b. 9a receives guidance instructions and

13   guidance parameters. 9b gets the automatic pilot instructions. And then in

14   figure 2 it sends the commands to 3 which is the flight control computer and

15   then the flight control computer is just passing them through unmodified.

16   JUDGE BAHR: Ok

17   EDWARD TRACY: So the control computer and the flight control

18   computer are different computers.

19   JUDGE BAHR: But for the purposes of the claim it seems to me they

20   could be the same.

21   EDWARD TRACY: Well, the discussion of, first of all I'd like to say

22   what's done in the art is very different from what's done in Pages. Again,

23   Pages is putting these commuters together. And thus the distinction over

24   these two background art figures is the dedicated link between the control

25   computer and the flight control computer.   It's shown in figure 3.

6

1   JUDGE BAHR: So you think that's the only distinction between the

2   admitted prior art and claim 1, the dedicated link?

3   EDWARD TRACY: Well also it deletes the computer 9b. It also

4   describes that the problem with the prior art, is that 9b...for example in

5   figure 1 the functionality of 9b is also in 3. And that causes redundant

6   processing and redundant, obviously testing and verification. So certainly

7   the one difference over figure 1 is to get rid of that computer and in effect 9b

8   is removed from both as you can see in figures...well figure three removes

9   9b, which is in both figures 1 and 2.

10   JUDGE BAHR: That's really got nothing to do with claim 1 does it?

11   Claim 1 doesn't exclude having another computer in there does it?

12   EDWARD TRACY: Well based on the functionality of each

13   computer that it describes. In figure 3, 9a is the navigation computer, which

14   receives the guidance instructions and guidance parameters. It transmits the

15   automatic pilot instructions to the flight control computer over the dedicated

16   link, 18. The control instructions and automatic pilot instructions are

17   received at the flight control computer, 3. Then in the automatic pilot mode

18   the flight control computer generates the operating commands based on the

19   automatic pilot instructions and in the manual pilot mode it generates the

20   operating commands based on the control instructions from the pilot.

21   JUDGE BAHR: Right.

22   EDWARD TRACY: So the functionality of 9b is now in 3. That the

23   generating of the operating commands is done by 3, and 9b is not there.

24

25   JUDGE BAHR: I understand that, but I'm not sure how that prior art

26   is distinguished from claim 1, other than the dedicated communication link.

1   EDWARD TRACY: Well in claim 1, the automatic pilot instructions

2   for the automatic pilot mode are generated by 9b not by…

3   JUDGE BAHR: Claim 1 says that?

4   EDWARD TRACY: No, the art does that. It describes the art

5   JUDGE BAHR: OK.

6   EDWARD TRACY: In the art that 9b is what generates the automatic

7   pilot instructions.

8   JUDGE BAHR: OK.

9   EDWARD TRACY: Well claim 1 says that the automatic pilot

10 instructions are transmitted to the navigation computer from the flight

11 control computer on a dedicated link. In the art you don't have the automatic

12 pilot instructions until you get to 9b. So for the navigation computer to

13 transmit the automatic pilot instructions to the flight control computer 9b

14 would have to send them back to 9a and then 9a would send them to 3. So

15 you're saying that that's not prevented by the claim, I mean…

16   JUDGE BAHR: I'm just looking at what that paragraph bridging

17 pages 1 and 2 says.

18   EDWARD TRACY: OK

19   JUDGE BAHR: I'm trying to find a distinction between that and

20 claim 1, other than the dedicated communication link or possibly that last

21 paragraph about "in an automatic pilot mode generating a first plurality of

22 operating commands in an…"

23   EDWARD TRACY: Well again, the control computer is 9b and does

24 not exist in the claimed invention. So the navigation computer receives

25 guidance instructions, this is from the top of page 2, and from these guidance

1   produces the automatic pilot instructions and then the control computer

2   converts the automatic pilot instructions into commands.

3   JUDGE BAHR: Right. That seems to me to be doing what the last

4   step here in generating a…

5   EDWARD TRACY: Right. The flight control computer is doing that.

6   JUDGE BAHR: Right. So what's called flight control computer in

7   claim 1 seems to be the control computer in the discussion of the prior art in

8   that paragraph.

9   EDWARD TRACY: Well the flight control computer also accepts the

10   commands from the pilot. And in the last element of claim 1 the flight

11   control computer does both; generates all the operating commands either

12   based on the automatic pilot instructions from the navigation computer or

13   based on the controller instructions from the flight control computer.

14   JUDGE BAHR: That's what the examiner brings in the second

15   reference in for right?

16   EDWARD TRACY: We…with the selection of one mode or the

17   other?

18   JUDGE BAHR: Right.

19   EDWARD TRACY: Right. I think in figure 1 and figure 2 had the

20   same mode. The difference is the redundant processing between 3 and 9b.

21   JUDGE BAHR: Why are you talking about figures 1 and 2? I'm

22   talking about the admitted prior art and the art that was relied on in claim 1.

23   I'm not talking about figure 1 and figure 2.

24   EDWARD TRACY: OK, Figures 1 and 2 is what's described on page

25   2.

1   JUDGE BAHR: Maybe, but that's not what's described... the

2   paragraph is a little broader.

3   EDWARD TRACY: I'm sorry.

4   JUDGE PATE: She said that the paragraph is broader than what's

5   shown in figures 1 and 2.

6   JUDGE BAHR: Figure 1 and 2 seem to be one embodiment or two

7   embodiments perhaps of what was know in the prior art, but it looks to me

8   like from that paragraph bridging pages one and two that it was known to do

9   these two separate calculations in two different computers.

10   EDWARD TRACY: Right, and in the middle of page two it describes

11 the redundancy problem of that, that you have to...

12   JUDGE BAHR: Well if there's a redundancy problem there, then

13 there's a redundancy problem in claim 1, because it doesn't seem to me that

14 there's anything more described in claim 1 with regard to the calculations

15 done by the two computers than is described in that paragraph bridging

16 pages one and two. Granted that may not talk about taking commands from

17 both the automatic pilot and from the controls from the airplane itself, but

18 I'm just getting at the calculations themselves, that there's two different

19 computers. One takes the guidance parameters, and from that calculates

20 automatic pilot instructions, and then transmits that to another computer,

21 which takes those instructions and from that generates control commands for

22 the operating surfaces.

23   EDWARD TRACY: In figures 1 and 2, and in the art that's described

24 on page 2, two different computers have the exact same processor. Two

25 different computers will take guidance commands and turn them into

26 automatic pilot instructions or guidance inputs and turn them into automatic

1   pilot instructions and then all merge into one computer, the flight control

2   computer in claim 1. In claim 1, the flight control computer gets both the

3   control instructions, which is from the pilot, and the automatic pilot

4   instructions, which is from the navigation computer, and takes one or the

5   other and turns those into the operating instructions. Where as in figures 1

6   and 2, those are done by two separate computers. So there's redundant

7   processing in that admitted art. And then in one of the distinctions of that

8   admitted art.

9   JUDGE BAHR: I'm not sure it's a claimed distinction but anyway,

10   why don't we move on.

11   JUDGE PATE: Fine.

12   EDWARD TRACY: OK, well in the last element it says the flight

13   control computer does both of those items. In automatic pilot mode

14   generating first priority operating commands based on automatic pilot

15   instructions at the flight control computer, and the manual pilot log

16   generates secondary priority updates on the control instructions of the flight

17   control computer. So the flight control computer does both of those

18   calculations.

19   JUDGE BAHR: I understand that.

20   JUDGE PATE: I think we're just agreeing to disagree here.

21   JUDGE BAHR: Yes.

22   JUDGE PATE: I don't think we're getting any further.

23   EDWARD TRACY: OK.

24   JUDGE PATE: Do you have any questions Judge Kerins?

25   JUDGE KERINS: I do not.

26   JUDGE PATE: You don't have any further questions?

1   JUDGE BAHR: NO

2   JUDGE PATE: We're going to take this case under advisement.

3   EDWARD TRACY: OK. Thank you.

4   JUDGE PATE: Thank you very much.

5   (Whereupon, at approximately 9:28 a.m., the proceedings were concluded.)